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# The Local Knowledge of Food Plants used by Karo Ethnic in Semangat Gunung Village, North Sumatra, Indonesia

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**Abstract.** Research on the local knowledge of food plants used by Karo ethnic in the Semangat Gunung Village, North Sumatra has been done. The aim of this study is to reveal plant species that used by the people of Karo ethnic as food. We used the ethnobotanical approach which included open-ended, semi-structural interview, and exploration method. One eldervillage, 2 traditional healers, and 30 respondents have been selected as sources of information. Descriptive statistics have been used to analyze the gathered data. A number of 109 species which belong to 83 genus and 45 families known to be used as food sources by Karo people. Four families have the highest number of food plant species, which are Solanaceae (8 species), Poaceae (7 species), Fabaceae (6 species), and Zingiberaceae (6 species). All of those families are found in the village, both wild and Cultivated. Solanaceae is used as source of fruits, vegetables, and spices. Poaceae is used as the source of the staple food, alternative food sources, snacks, spices, and traditional foods. Fabaceae is used as source of vegetables and traditional foods. Zingiberaceae is used as source of spices.

## INTRODUCTION

Indonesia is known as a country with high plant diversity as well as ethnicity. Kartawinata [1] reported that the number of plant species in Indonesia is more than 30.000 species. According to Walujo [2], a local knowledge community in plant utilization is formed due to the high potential of plant diversity.

Numerous plant species in Indonesia have been used as foods, medicines, local technologies, traditional ceremonies, and dyes by local communities [3]. The use of plant sources of food is one of the most essential ones [4]. Food plants used to occupy various needs, such as the body's nutritional needs, health, and indigenous ceremony or rituals. Local knowledge in plant use inherited from generation to generation orally or rarely written. Knowledge of food plant species varies between ethnic groups or communities, usually depend on the diversity of plants around their home.

Karo is one of the ethnic groups in Indonesia that live in North Sumatra, particularly the Karo highland. Food plants defined by Karo people as something which consumed to fulfill the daily meet. It categorized by the use of each species based on Karo person's perception, such as staple food plant, alternative food source, vegetables, fruits, snacks, spices, and traditional food. Various reports stated that Karo ethnic inherit good local knowledge about plant utilization, especially food plants, but the number of studies is limited. Suparthana *et al.* [5] and Purba [6] stated that traditional food is still well preserved by Karo ethnic, one of the most interesting is *terites*. *Terites* usually served at the annual traditional event called *Merdang Merdem* (Kerja Tahun).

Undocumented local knowledge may become degraded or even lost. Written documentation is one of the ways to prevent the loss of local knowledge. According to Walujo [2], documentation of plant utilization is a manifestation of the plant conservation. This study aimed to reveal and document the local knowledge of food plants among the Karo Ethnic.

## METHODS

The study was conducted in the Semangat Gunung Village, North Sumatra, Indonesia. The Semangat Gunung Village is inhabited by more than 80 % Karo people, the others are Batak Toba, Acehese, Minang, and Javanese. The main livelihood of Karo people in the Semangat Gunung Village is farming.

The data were collected by open-ended and semistructural interview as well as explorative technique [7]. Key informant and respondents were determined by purposive sampling technique [8]. The data were analyzed using descriptive statistics [7]. Descriptive statistics are used to describe the number of plant species based on its uses.

## RESULTS AND DISCUSSION

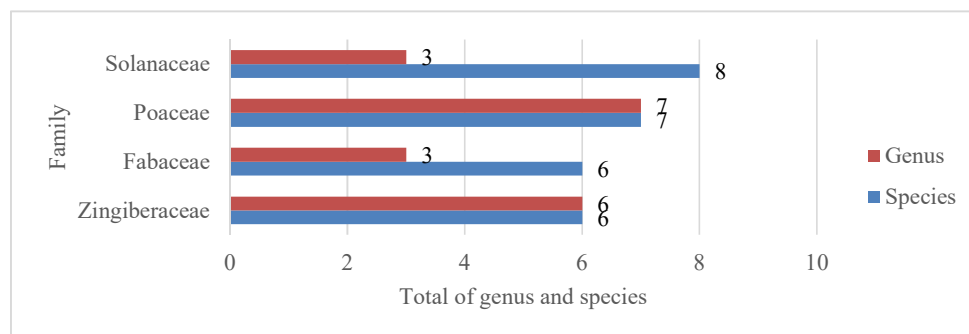
The study revealed 109 species food plants which belong to 83 genus and 45 families known to be used as food sources by Karo people. The number of species obtained are higher than other ethnic groups in Indonesia, such as Batak Toba in Peadungdung Village (72 species) [9], Angkola in Padang Bujur Village (49 species) [10], and Buton in Lambusango Village (80 species) [11], as well as some ethnic groups in other countries such as, Matigsalug in Philippines (26 species) [12], Tibeto-Burman in China (43 species) [13], and Rabha in India (45 species) [14]. This probably caused by the high diversity of plants around their village and their excellent ability to use a great amount of plant resources around them.

Differences in the number of food plant species known by Karo people with other ethnic groups are influenced by several factors, including the diversity of plant species and ethnic. The high of ethnic diversity in Indonesia (1,128 ethnics) [15] has led more ethnic groups to look and collect plants as food plants. The high diversity of food plants in the Semangat Gunung Village shows that local knowledge of Karo people can be used as a reference to improve the diversity of food plants.

Food plant species that have been obtained is dominated by Solanaceae, Poaceae, Fabaceae, and Zingiberaceae family. All of those families are easy to be found in the village, either wild or Cultivated, so that they become more frequently used. The number of species from those families representing 24.77 % of the total species that used as food plants (Fig. 1).

### Solanaceae

Members of Solanaceae are commonly used by people around the world [16]. Karo people use Solanaceae as source of fruits (2 species), spices (2 species), and vegetables (4 species) (Table 1). All species of this family have been commonly used by people in the world as food plants, except *depuk-depuk* (*Physalis peruviana* L.). *Depuk-depuk* used by Karo people as a source of fruit. High content of ascorbic acid (46 mg/100 g) is good for the growth and maintenance of tissues, the production of neurotransmitters, hormones, and the immune system response [17]. *Depuk-depuk* grows wild on the edge of the moat around the field, so the people of Karo usually eat the fruits during farming activities.



**FIGURE 1.** Families of most genus and species of food plants which used by Karo people in Semangat Gunung Village

## Poaceae

The use of Poaceae family by Karo people includes staple food (1 species), alternative food source (1 species), snacks (2 species), Vegetables (2 species), spices (4 species), and traditional foods (5 species) (Table 1). The use of *page-page* (*Panicum repens* L.) and *tali kampung* (*Paspalum conjugatum* P.J. Bergius) as spices is a new record for the use of those species compared to previous literatures [9, 18, 19]. Other ethnic communities generally use both of these species as fodder or medicines [18].

*Page-page* and *tali kampung* initially used as fodder. Early use of these species as spices came from a rich family in Seberaya Village, North Sumatra, who deliberately trying to cook meat goat (*Capra aegagrus hircus* L.) and grass juice was obtained from the rumen. Grass juice was initially used as substitute for Vegetables, but latter, their parents like it. Karo people then use it as a spice known as *terites*.

## Fabaceae

Karo people in the Semangat Gunung Village utilize Fabaceae family as Vegetables (6 species) and traditional food sources (2 species) (Table 1). Both *kacang merah* (*Vigna angularis* (Willd.) Ohwi & H. Ohashi) and *retak* (*Vigna radiata* (L.) R. Wilczek) used by them as Vegetables and traditional food sources, which they named it *gule umbut*. *Gule umbut* served during the traditional event called *nurun-nurun* (funeral ceremony). This food made from a mixture of *kacang merah*, *retak*, and *umbut* of *galuh si uncim* (*Musa acuminata* Colla). *Kacang merah* and *retak* have been selected as ingredients because of its affordable prices compared to other species of Fabaceae. So, the bereaved family does not need to pay high prices for the ceremony.

In fact, many species of Fabaceae have been widely known as a good source of nutrition which rich in protein, fat, carbohydrates, vitamins, and microelements [20]. The ability of Fabaceae to fix nitrogen causes the concentration of protein in seeds reached 40 % of the dry weight. The high nutritional value of Fabaceae has caused many people to use the seeds as a source of food. Another variation of the use of Fabaceae found in local people in the rural areas Holarctic, Neotropical, and Sub-Antarctic that use this family as medicines [21].

## Zingiberaceae

Many species of Zingiberaceae used by Karo people as spices (Table 1). *Pincouli* (*Hedychium coronarium* J. Koenig) is an example of Zingiberaceae which used as spices. Karo people used *pincouli* as aroma on *arsik*, a traditional food. According to the literature, the fragrance of *pincouli* derived from the volatile compounds which consist of 20.0 %  $\beta$ -pinene, 15.8 % linalool, 10.1 %  $\alpha$ -pinene, 10.7 % 1,8-cineole, and 8.6 %  $\alpha$ -terpeneol [22].

## CONCLUSIONS

Karo people in the Semangat Gunung Village used 109 species which belong to 83 genus and 45 families as food plants. Four families have the highest number species used as food sources, which are Solanaceae, Poaceae, Fabaceae, and Zingiberaceae. Source of fruits is Solanaceae family. Sources of vegetables are Solanaceae and Fabaceae. Sources of spices are Solanaceae, Poaceae, and Zingiberaceae. Sources of traditional foods are Poaceae and Fabaceae. Source of staple food, alternative food, and snacks is Poaceae.

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